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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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WESTMAN CHAMPLIN & KELLY, P.A. SUITE 1400 900 SECOND AVENUE SOUTH MINNEAPOLIS, MN 55402-3319				
			EXAMINER VATHYAM, SUREKHA	
			ART UNIT 1753	PAPER NUMBER

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/607,856	Applicant(s) SHUK ET AL.	
	Examiner Surekha Vathyam	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>04/04 & 10/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "first and second cover" in claims 1 - 12 must be shown or the features canceled from the claims. No new matter should be entered.
2. The drawings are objected to because the unit of measure for the Y-axis in Figures 6 and 17 is marked as " 2θ " and no further explanation of " 2θ " is provided in the description and similarly the units of measure for the X and Y-axis in Fig. 19 are unclear and symbols used are not described in detail in the specification.
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 50 (first full paragraph on page 16).
4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required

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corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Information Disclosure Statement

5. The information disclosure statement filed 10/08/2004 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. The foreign language references for which no brief statement of relevance has been provided have been crossed off on the listing of references by the examiner.

Specification

6. The disclosure is objected to because of the following informalities: On page 17, the second full paragraph uses the term "AFM" without providing any explanation.

Appropriate correction is required.

Claim Objections

7. Claims 1 and 13 are objected to because of the following informalities: line 2 and 11 of claim 1 and line 2 of claim 13 have the word "specie" which means coined money. The word "specie" apparently should read "species". Appropriate correction is required.

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8. Claim 30 is objected to because of the following informalities: Line 3 of claim 30 has "on mixed valency element" which should be "one mixed valency element". Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. Claims 20 – 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Claims 20 - 22 recite the limitation "the electrode film" in line 2 of the respective claims. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1 - 6 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Light (GB 761,055).

Regarding claim 1, Light ('055) discloses a device (Fig. 1) for sensing a concentration of a combustible species of interest (page 2, lines 65 – 79), the device including: a holder (1); a first RTD (6) disposed in a first cover (9), wherein the first cover (9) is mounted to the holder (1); a second RTD (5) disposed in a second cover

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(9), wherein the second cover (9) is mounted to the holder (1); and wherein the first cover (9) has a higher catalytic activity to the species of interest than the second cover (9) (page 2, lines 24 – 35).

Regarding claim 2, Light ('055) discloses the first cover is formed from a tube (page 2, lines 21 – 24).

Regarding claim 3, Light ('055) discloses the second cover is formed as a tube (page 2, lines 21 – 24).

Regarding claim 4, Light ('055) discloses the first cover has a catalyst film disposed thereon (page 2, lines 41 – 47).

Regarding claim 5, Light ('055) discloses the film is metal (page 2, lines 41 – 47).

Regarding claim 6, Light ('055) discloses the metal is platinum (page 2, lines 80 – 84).

Regarding claim 11, Light ('055) discloses at least one of the first and second cover is joined to the holder using thermally insulative material (page 2, lines 65 – 75).

13. Claims 1-4, 7, 9 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Valentine et al. (US 2,916,358).

Regarding claim 1, Valentine ('358) discloses a device (Fig. 1) for sensing a concentration of a combustible species of interest (column 1, lines 15 – 16), the device including: a holder (3); a first RTD (5) disposed in a first cover (43), wherein the first cover (43) is mounted to the holder (3); a second RTD (4) disposed in a second cover (42), wherein the second cover (42) is mounted to the holder (3); and wherein the first

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cover (43) has a higher catalytic activity to the species of interest than the second cover (42) (column 2, lines 18 – 28).

Regarding claim 2, Valentine ('358) discloses the first cover is formed from a tube (column 2, lines 15 – 18).

Regarding claim 3, Valentine ('358) discloses the second cover is formed as a tube (column 2, lines 15 – 18).

Regarding claim 4, Valentine ('358) discloses the first cover has a catalyst film deposited thereon (column 2, lines 23 – 28).

Regarding claim 7, the film is a metal oxide (column 2, lines 23 – 28).

Regarding claim 9, the film is hopcalite (column 2, lines 23 – 28).

Regarding claim 11, Valentine ('358) discloses at least one of the first (43) and second cover (42) is joined to the holder (3) using thermally insulative material (column 2, lines 15 – 18).

14. Claims 1 – 7, 10 – 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Dalla Betta et al. (US 5,314,828).

Regarding claim 1, Dalla Betta ('828) discloses a device (see Fig. 6) for sensing a concentration of a combustible species of interest (column 4, lines 10 – 12), the device including: a holder (626); a first RTD (114) disposed in a first cover (112), wherein the first cover (112) is mounted to the holder (626 via 110); a second RTD (124) disposed in a second cover (126), wherein the second cover (126) is mounted to

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the holder (626 via 122); and wherein the first cover (112) has a higher catalytic activity to the species of interest than the second cover (126) (column 4, lines 13 – 19).

Regarding claim 2, Dalla Betta ('828) discloses the first cover (112) is formed from a tube (see Fig. 1).

Regarding claim 3, Dalla Betta ('828) discloses the second cover (112) is formed as a tube (see Fig. 1).

Regarding claim 4, Dalla Betta ('828) discloses the first cover (112) has a catalyst film disposed thereon (column 6, lines 36 - 40).

Regarding claim 5, Dalla Betta ('828) discloses the film is metal (column 6, 66 - 67).

Regarding claim 6, Dalla Betta ('828) discloses the metal is platinum (column 6, lines 66 – 67).

Regarding claim 7, Dalla Betta ('828) discloses the film is a metal oxide (column 6, lines 47 – 49).

Regarding claim 10, Dalla Betta ('828) discloses the second cover (126) is constructed from a catalyst-free (column 7, lines 14 – 18) stainless steel tube (column 15, line 4 – 6).

Regarding claim 11, Dalla Betta ('828) discloses at least one of the first (112) and second cover (126) is joined to the holder (626 via 110 and 122 respectively) using thermally insulative material (column 5, line 54 – column 6, line 11 and column 7, lines 49 – 51).

Regarding claim 12, Dalla Betta ('828) discloses the thermally insulative material is selected from the group of ceramic cement, adhesive, and high-temperature epoxy (column 5, line 54 – column 6, line 11 and column 7, lines 49 – 51).

15. Claims 13 – 16 and 18 - 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokota et al. (US 6,368,479).

Regarding claim 13, Yokota ('479) discloses a device (see fig. 1) for determining a concentration of a combustible species of interest in an exhaust stream (column 1, lines 6 – 14), the device including: a solid electrolyte (6); a reference electrode (2, 4) that is inactive to the combustion reaction (column 6, lines 11 – 15); and a working electrode (3, 5) that is catalytically active to the combustion reaction (column 6, lines 55 – 65) and wherein the working electrode (3, 5) and the reference electrode (2, 4) are coupled to the solid electrolyte (6) (see fig 1. and column 6, lines 55 – 58).

Regarding claim 14, Yokota ('479) discloses the reference and working electrodes are couplable to the exhaust stream (column 4, lines 25 – 42).

Regarding claim 15, Yokota ('479) discloses the solid electrolyte (6) is selected from the group consisting of doped zirconia, ceria, and bismuth oxide (column 5, lines 57 – 64).

Regarding claim 16, Yokota ('479) discloses the reference electrode (2, 4) is constructed from gold (column 3, lines 54 – 58).

Regarding claim 18, Yokota ('479) discloses the working electrode (3) is constructed from platinum (column 7, lines 17 – 20).

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Regarding claim 19, Yokota ('479) discloses the working electrode (3, 5) is constructed from a metal oxide (column 7, lines 26 – 28, column 8, lines 28 – 34).

Regarding claim 20, Yokota ('479) discloses the working electrode (3, 5) is constructed using doped ceria (column 5, lines 57 – 64).

16. Claims 23 - 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Isenberg (US 4,428,817).

Regarding claim 23, Isenberg ('817) discloses a solid state device (9) for determining the concentration of oxygen in a gas phase (column 1, lines 8 – 11), the device comprising: solid electrolyte (33) a reference electrode (35) coupled to the solid electrolyte (33); and a working electrode (37) constructed from a mixed ion/electron conducting oxide (column 3, lines 55 – 60), wherein the working electrode is coupled to the solid electrolyte (see Fig. 1).

Regarding claim 24, Isenberg ('817) discloses the solid electrolyte (33) is selected from the group consisting of zirconia and ceria (column 3, lines 39 – 42).

Regarding claim 25, Isenberg ('817) discloses the reference electrode (35) is constructed from the group consisting of platinum, a metal oxide electrode, and a mixed conducting electrode (column 3, line 46 - 51).

Regarding claim 26, because of the phrase "group consisting of platinum, a metal oxide electrode, and a mixed conducting electrode" recited in parent claim 25, and the disclosure of platinum in column 3 lines 46 – 51 of Isenberg ('817), claim 26 is anticipated regardless of any disclosure concerning perovskite.

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Regarding claim 27, because of the phrase "group consisting of platinum, a metal oxide electrode, and a mixed conducting electrode" recited in parent claim 25, and the disclosure of platinum in column 3 lines 46 – 51 of Isenberg ('817), claim 27 is anticipated regardless of any disclosure concerning fluorite.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

19. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not

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commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

20. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dalla Betta et al. (US 5,314,828) in view of Lauder (US 3,897,367).

Dalla Betta ('828) discloses a device for sensing a concentration of a combustible species of interest comprising a first cover (112) which has a catalyst film disposed thereon as discussed with regards to claim 4 above.

Regarding claim 8, Dalla Betta ('828) discloses the film is a metal oxide (column 6, lines 47 – 49) but does not specifically disclose perovskite.

Lauder ('367) teaches the film is a perovskite (column 5, lines 61 – 63).

It would have been obvious to one of ordinary skill in the art to have modified the sensor (Fig. 6) of Dalla Betta ('828) by using a perovskite film as taught by Lauder ('367) because as Lauder ('367) explains perovskite provides the benefit of stability and durability at high temperatures and has been shown to catalyze the oxidation of hydrocarbons and carbon monoxide (column 7, lines 4 – 17).

21. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yokota et al. (US 6,368,479) in view of Blumenthal et al. (US 4,101,404).

Regarding claim 17, the device of Yokota ('479) was discussed above with regard to claim 13.

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Yokota ('479) does not explicitly disclose the reference electrode (2, 4) being constructed from doped lanthanoid chromite.

Blumenthal ('404) teaches constructing an electrode from doped lanthanum chromite (see column 5, lines 55 - 66).

It would have been obvious to one of ordinary skill in the art to have modified the device of Yokota ('479) by constructing the reference electrode (2, 4) from doped lanthanum chromite as taught by Blumenthal ('404) because Blumenthal ('404) explains that doped lanthanum chromite "solves the problem of electrode corrosion" (column 5, lines 61 - 62).

22. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokota et al. (US 6,368,479) in view of Isenberg (US 5,106,654).

Regarding claims 21 and 22, the device of Yokota ('479) was discussed above with regard to claim 19.

Yokota ('479) does not explicitly disclose the electrode being constructed from doped lanthanum manganite (claim 21) or from perovskite (claim 22).

Isenberg ('654) teaches constructing an electrode from doped lanthanum manganite and teaches constructing an electrode from perovskite (column 1, lines 18 - 25).

It would have been obvious to one of ordinary skill in the art to have modified the device of Yokota ('479) by constructing the electrode from doped lanthanum manganite and from perovskite as taught by Isenberg ('654) because Isenberg ('654) explains that

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doped lanthanum manganite and perovskite make electrodes particularly suitable for high temperature applications (column 1, lines 18 - 25)

23. Claims 28 – 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isenberg (US 4,428,817) in view of Ruka et al. (US 5,021,304).

Regarding claim 28, Isenberg ('817) discloses the device as discussed with regards to claim 23 above.

Isenberg ('817) does not explicitly disclose the working electrode (37) is constructed from ceria or its solid solution doped with at least one mixed valency element.

Ruka ('304) teaches a working electrode (10) is constructed from ceria or its solid solution (column 4, lines 44 – 49) doped with at least one mixed valency element (column 4, lines 49 – 59).

It would have been obvious to one of ordinary skill in the art to have modified the device of Isenberg ('817) by constructing the electrode from ceria or its solid solution doped with at least one mixed valency element as taught by Ruka ('304) because Ruka ('304) explains that doped ceria provides the electrode with improved sulfur resistance (column 1, lines 16 – 37).

Regarding claim 29, Ruka ('304) teaches the mixed valency element is one of terbium and praseodymium (column 4, lines 55 – 56).

Regarding claim 30, Isenberg ('817) discloses the device as discussed with regards to claim 23 above.

Isenberg ('817) does not explicitly disclose the working electrode (37) is constructed from a solid solution of ceria doped with at least one mixed valency element.

Ruka ('304) teaches a working electrode (10) is constructed from a solid solution of ceria (column 4, lines 44 – 49) doped with at least one mixed valency element (column 4, lines 49 – 59).

It would have been obvious to one of ordinary skill in the art to have modified the device of Isenberg ('817) by constructing the electrode from a solid solution of ceria doped with at least one mixed valency element as taught by Ruka ('304) because Ruka ('304) explains that doped ceria provides the electrode with improved sulfur resistance (column 1, lines 16 – 37).

Regarding claim 31, Ruka ('304) teaches the mixed valency element is one of terbium and praseodymium (column 4, lines 55 – 56).

24. Claims 32 – 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sheridan et al. (US 5,627,328) in view of Dalla Betta et al. (US 4,355,056).

Regarding claim 32, Sheridan ('328) discloses a process analytic system (12) comprising: a sample probe (10) having at least one sensor (44, 46, 48) disposed therein; a controller (18) coupled to the sample probe (10) to measure a parameter of

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an exhaust stream (column 10, line 66 – column 11, line 12); and a blowback system (column 8, lines 64 – 67) coupled to the sample probe (10) and the controller (18) to responsively reverse gas flow through the sample probe (84, column 8, line 67 – column 9, line 4).

Sheridan ('328) does not explicitly disclose the sensor (44, 46, 48) being sulfur-resistant.

Dalla Betta ('056) teaches a sensor that is sulfur-resistant (column 4, lines 55 – 58).

It would have been obvious to one of ordinary skill in the art to have modified the process analytic system (12) of Sheridan ('328) by having the sensor (44, 46, 48) in the sample probe (10) be sulfur-resistant as taught by Dalla Betta ('056) because it provides the benefit of relative insensitivity to sulfur poisoning and ability to operate at elevated temperature for extended periods of time as explained by Dalla Betta ('056) (column 4, lines 55 – 58).

Regarding claim 33, Sheridan ('328) discloses the sample probe (10) includes a plurality of sensors (44, 46, 48).

Sheridan ('328) does not explicitly disclose the plurality of sensors (44, 46, 48) being sulfur-resistant.

Dalla Betta ('056) teaches a sensor that is sulfur-resistant (column 4, lines 55 – 58).

It would have been obvious to one of ordinary skill in the art to have modified the process analytic system (12) of Sheridan ('328) by having the plurality of sensors (44,46, 48) in the sample probe (10) be sulfur-resistant as taught by Dalla Betta ('056) because it provides the benefit of relative insensitivity to sulfur poisoning and ability to operate at elevated temperature for extended periods of time as explained by Dalla Betta ('056) (column 4, lines 55 – 58).

Regarding claim 34, Sheridan ('328) discloses the sensor (48) is an oxygen sensor (column 7, lines 13 – 23).

Regarding claim 35, Sheridan ('328) discloses the sensor (44, 46) is a combustible sensor (column 7, lines 13 – 23).

Regarding claim 36, Sheridan ('328) discloses the sample probe (10) includes a particulate filtering enclosure (54).

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Dalla Betta et al. (US 5,338,515) discloses a SO₂ sensor.

Zegel (US 3,687,631) discloses the use of hopcalite and metal oxides as catalysts in RTD type sensor.

Beck et al. (US 5,444,974) discloses stainless steel tube in RTD sensor.

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James et al. (US 5,766,789) discloses doped ceria electrode.

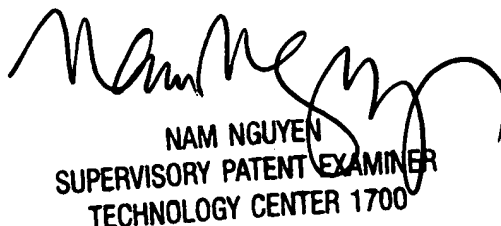
Iwao et al. (US 3,759,087) discloses a gas analyzer with blowback system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Surekha Vathiyam whose telephone number is 571-272-2682. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SV
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